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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,304	09/01/2004	Fan Bin	17707-002US1	3220
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EXAMINER				
DOWLING, WILLIAM C				
ART UNIT		PAPER NUMBER		
2851				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary

Application No.

10/506,304

Applicant(s)

BIN ET AL.

Examiner

William C. Dowling

Art Unit

2851

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13 and 15-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13 and 15-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date 21708
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 37,13-16, 18, 20-24, 33, 35-36, 43-46, 48-50, 51, 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. (5,552,840) in view of Yang (5,612,814).

Ishii et al. (5,552,840) discloses a projection system comprising:

a single polarizing beamsplitting cube prism (70 having polarizing surface (70a);

LCD panels (12, 12');)

a light source (16);

projection means (5) for amplifying the image for projection.

As noted in Column 14 Lines 1-3 the LCD's may be formed of LCOS type.

A particular embodiment uses colored microfilters (994a, 94b, 94c) adjacent individual pixels of the LCD panels to transmit primary colors red, blue, and green.

The structure of Ishii et al. may utilize different images to form a three dimensional projection or images of a same view to form a conventional projected image.

Ishii et al. does not teach the use of dichroic filters as the filter means.

Yang (5,612,814) teaches the use of dichroic color filter means (220) adjacent a reflective image modulator.

It would have been obvious to one skilled in the art at the time of the invention to modify the device of Ishii et al. by the substitution of dichroic filter means for dye filters in order to reflect undesired colors and avoid heat buildup caused by absorption. It further would have been obvious to one skilled in the art to place such color filters at any position between the entrance to the display panels and the particular modulating elements because such a structure would operate in alike manner. It would have also been obvious to form the filter elements integrally with the panels so as the be a part of the panels themselves because such an integral display panels eliminates the necessity for aligned of optical elements and simplifies the structure.

2. Claims 17, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. and Yang in view of Brennesholtz.

Ishii et al. disclose the invention substantially as claimed but do not teach the use of cyan, magenta, and yellow filters on the second panel.

With respect to Claim 17, the use of yellow, cyan, and magenta is well known as an alternate to the use of red, green, and blue modulators in order to form full color images. It is further known to utilize all six colors to form a six-color gamut.

Brennesholtz teaches a two-panel projection system wherein one panel modulates red, green, and blue light while a second panel modulates cyan, yellow and magenta.

It would have been obvious to one skilled in the art at the time of the invention to modify the device of Ishii in the standard projection mode by the use of six different color microfilters in order to form a six color projection device in order to achieve increased color mixing.

3. Claims 37-43, 45-46, 48-50,, 51-53, 13, 15-16, 19, 23, 25-33, 36 are rejected under 35

U.S.C. 103(a) as being unpatentable over Fulkerson et al. (6,490,087) in view of Yang (5,612,814)..

Fulkerson et al. (6,490,087) discloses a projection system comprising:

Embodiment 1, Figure 2:

a single cube prism (2) having polarizing surfaces (6, 7);

LCD panels (8,9);

A light source (16).

As noted in Column 9 Lines 9-10, the LCD's may be formed of LCOS type

Embodiment 2, Figure 3:

Four prisms (26A, 26B, 26C, 26D);

A light source (16);

Half wave plates (28);

Polarizers (30);

LCD's (8,9)

As noted in column 9 Lines 11-16, color filter means may be positioned between the prism surfaces and a respective LCD panel.

Yang (5,612,814) teaches the use of dichroic color filter means (220) adjacent a reflective image modulator. Figure 3A shows the full color structure of the color filter (220)

It would have been obvious to one skilled in the art at the time of the invention to modify the device of Fulkerson by the use of dichroic type means in order to reflect undesired colors and avoid heat buildup caused by absorption of lights. It further would have been obvious to one skilled in the art to place such color filters at any position between the entrance to the display panels and the particular modulating elements because such a structure would operate in alike manner. It would have also been obvious to form the filter elements integrally with the panels so as the be a part of the panels themselves because such an integral display panels eliminates the necessity for aligned of optical elements and simplifies the structure.

4. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. and Yang in view of Pentico et al. (6,857,747).

Ishii et al. disclose the invention substantially as claimed but do not teach the use of quarter wave plates between the panels and the PBS. Ishii et al. does teach the

use of birefringent plate between the PBS and the screen for forming circularly polarized lights. Quarter wave plates are known birefringent means to rotate linear polarized light to circular.

Pentico et al. further clarifies the use of quarter wave plates on a light path from two reflective modulators to a PBS (Column 9 Lines 52-55) to separately modify the rotation of light.

As best as the application disclosure explains the use of quarter wave plates (a single statement), it would have been obvious to one skilled in the art at the time of the invention to modify the device of Ishii et al. by the use of two retarder plates before the PBS rather than a single one after the PBS, as taught by Pentico, in order to allow for individual rotation of the lights.

Response to Arguments

5. Applicant's arguments filed 7/3/08 have been fully considered but they are not persuasive.

Applicant first argues that the filter array as taught by Yang is not a reflective dichroic array and that it must be an absorbing array in order to avoid light interference effects. In response it is noted that Yang explicitly states that the array is formed with dichroic coatings (Column 4 Line 62) Such materials are well known to act as color dividing means wherein a wavelength range is transmitted while other ranges are reflected. As defined at solarisnetwork.com dichroic is defined as "In optics, the term dichroic has two related but distinct meanings. A dichroic material is one which either

causes light to be split up into distinct beams of different wavelengths (colours), or, one in which light rays having different polarizations are absorbed by different amounts.

The original meaning of dichroic (from the Greek *dikhroos*, two-coloured) refers to any optical device which can split a beam of light into two beams with differing wavelengths. Such devices include mirrors and filters, usually treated with optical coatings, which are designed to reflect light over a certain range of wavelengths, and transmit light which is outside that range. An example is the dichroic prism, used in some camcorders, which uses several coatings to split light into red, green and blue components for recording on separate CCD arrays. This kind of dichroic device does not usually depend on the polarization of the light.

As to applicant's argument that reflecting the non transmitted colors would result in light interference, it is noted that such is not the case because the reflected lights from the filter array would be reflected back along the path they came from and returned to the light source by the reflector. One skilled in the art would also have recognized that using such filters with polarized light structures, such as prisms would also allow for recapturing of the unused portion of light.

Applicant further argues that the modified device of Ishii being provided with reflective type filters would result in a monochrome display. This statement is not understood. Green blue and red color filters (94a, 94b, 94c) are provided before LC layer (92) and before reflective substrate (95). The use of dichroic filters would in no way change the mode of operation of the LC panels in Ishii. The rationale for making

such a substitution is the avoidance of heat buildup and the reuse of the nonfiltered reflected lights.

As regards repositioning of the filters it is the level or ordinary skill that provides the basis for such a conclusion because one skilled in the art that the filter could be positioned as desired so long as the desired filtering indeed take effect.

As regards applicant's argument with respect to the rejection over Fulkerson in view of Yang, Yang is relied upon for it's teaching that reflective dichroic arrays with pixels corresponding to modulation pixels are known as efficient filter devices and as such would have been an obvious type of filter for use in a system as disclosed by Fulkerson.

Conclusion

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Dowling whose telephone number is 571-272-2116. The examiner can normally be reached on MON-THURS.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on 571-272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William C. Dowling/
Primary Examiner, Art Unit 2851

wcd